

Application Number 10/036,603
Responsive to Office Action mailed April 15, 2005

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1-38 (Canceled).

Claim 39 (Currently Amended): An apparatus comprising:

- a set of input ports to receive data packets;
- a set of sink ports coupled to said set of input ports to receive and forward said data packets;
- a set of data rings coupling said set of input ports and said set of sink ports; and
- a multi-sink port coupled to a data ring in said set of data rings ~~and a sink port in said set of sink ports~~, wherein the multi-sink port:

- identifies a destination address in one of said data packets;

- identifies one or more recipient sink ports in said set of sink ports; and

- issues a transmission request to said recipient set of sink ports.

Claim 40 (Previously Presented): The apparatus of claim 39, wherein said multi-sink port is coupled to each data ring in said set of data rings and each sink port in said set of sink ports.

Claim 41 (Previously Presented): The apparatus of claim 39, wherein said multi-sink port snoops data packets on said data ring to determine whether to accept said data packets based on a first set of criteria.

Claim 42 (Previously Presented): The apparatus of claim 41, wherein said first set of criteria includes said data packets containing destination addresses supported by said sink port.

Application Number 10/036,603

Responsive to Office Action mailed April 15, 2005

Claim 43 (Previously Presented): The apparatus of claim 42, wherein said first set of criteria further includes:

- said multi-sink port being enabled to receive data packets; and
- said multi-sink port having sufficient resources to store said data packets.

Claim 44 (Previously Presented): The apparatus of claim 39, wherein said multi-sink port forwards a data packet from said data ring to said sink port.

Claim 45 (Previously Presented): The apparatus of claim 44, wherein said multi-sink port forwards said data packet to said sink port if said data packet has a destination address corresponding to said sink port.

Claim 46 (Previously Presented): The apparatus of claim 45, wherein said multi-sink port includes a table correlating destination addresses to sink ports in said set of sink ports.

Claim 47 (Previously Presented): The apparatus of claim 44, wherein said sink port determines whether to accept said data packet based on a second set of criteria.

Claim 48 (Previously Presented): The apparatus of claim 47, wherein said second set of criteria includes:

- said sink port having sufficient storage resources for storing said data packet; and
- a total number of packets being received by said sink port not exceeding a predetermined number of packets.

Claim 49 (Previously Presented): The apparatus of claim 39, wherein said multi-sink port includes:

- a ring interface coupled to said set of data rings to receive data;
- a storage buffer coupled to said ring interface to receive and store data; and
- a sink request port coupled to said storage buffer to receive data from said storage buffer and transmit said data.

Application Number 10/036,603
Responsive to Office Action mailed April 15, 2005

Claim 50 (Previously Presented): The apparatus of claim 49, wherein said multi-sink port further includes a look-up table coupled to said sink request port containing entries that correlate destination addresses to sink ports in said set of sink ports.

Claim 51 (Previously Presented): The apparatus of claim 49, wherein a sink port in said set of sink ports includes:

- a sink port ring interface coupled to said set of data rings to receive data;
- a sink port storage buffer coupled to said sink port ring interface and said sink request port to receive and store data; and
- an output port coupled to said storage buffer to receive data from said sink port storage buffer and transmit said data on a communications link.

Claim 52 (Previously Presented): The apparatus of claim 51, wherein a first data bus couples said sink request port to said sink port storage buffer and a second data bus couples said sink request port to said sink port storage buffer.

Claim 53 (Previously Presented): The apparatus of claim 39, wherein a sink port in said set of sink ports includes:

- a sink port ring interface coupled to said set of data rings to receive data;
- a sink port storage buffer coupled to said sink port ring interface and said multi-sink port to receive and store data; and
- an output port coupled to said sink port storage buffer to receive data from said sink port storage buffer and transmit said data on a communications link.

Application Number 10/036,603
Responsive to Office Action mailed April 15, 2005

Claim 54 (Previously Presented): The apparatus of claim 53, wherein an input port in said set of input ports includes:

- a communications interface to receive data packets from a communications link; and
- an input port storage buffer coupled to said communications interface to store data from said data packets, said input port storage buffer coupled to at least one data ring in said set of data rings.

Claim 55 (Currently Amended): A cross-bar switch comprising:

- a set of input ports to receive data packets from a communications link;
- a set of sink ports coupled to said set of input ports to receive said data packets from said set of input ports;
- a set of data rings internal to the cross-bar switch and coupling each sink port in said set of sink ports to each input port in said set of input ports; and
- a multi-sink port coupled to each data ring in said set of data rings and each sink port in said set of sink ports.

Claim 56 (Previously Presented): The cross-bar switch of claim 55, wherein each sink port in said set of sink ports snoops data packets on each data ring in said set of data rings and said multi-sink port snoops data packets on each data ring in said set of data rings.

Claim 57 (Previously Presented): The cross-bar switch of claim 55, wherein said multi-sink port snoops data packets on each data ring in said set of data rings to determine whether said data packets are destined for at least one sink port in said set of sink ports.

Claim 58 (Previously Presented): The cross-bar switch of claim 57, wherein said multi-sink port snoops each of said data packets to determine whether said each of said data packets contains a destination address supported by at least one sink port in said set of sink ports.

Claim 59 (Previously Presented): The cross-bar switch of claim 58, wherein said multi-sink port includes a table correlating destination addresses to sink ports in said set of sink ports.

Application Number 10/036,603
Responsive to Office Action mailed April 15, 2005

Claim 60 (Previously Presented): The cross-bar switch of claim 55, wherein said multi-sink port includes:

- a multi-sink port ring interface coupled to said set of data rings to receive data;
- a multi-sink port storage buffer coupled to said multi-sink port ring interface to receive and store data;
- a sink request port coupled to said multi-sink port storage buffer to receive data from said multi-sink port storage buffer and transmit said data.

Claim 61 (Previously Presented): The cross-bar switch of claim 60, wherein said multi-sink port further includes a look-up table coupled to said sink request port containing entries that correlate destination addresses to sink ports in said set of sink ports.

Claim 62 (Previously Presented): The cross-bar switch of claim 60, wherein a sink port in said set of sink ports includes:

- a sink port ring interface coupled to said set of data rings to receive data;
- a sink port storage buffer coupled to said sink port ring interface and said sink request port to receive and store data; and
- an output port coupled to said sink port storage buffer to receive data from said sink port storage buffer and transmit said data on a communications link.

Claim 63 (Previously Presented): The cross-bar switch of claim 62, wherein a first data bus couples said sink request port to said sink port storage buffer and a second data bus couples said sink request port to said sink port storage buffer.

Application Number 10/036,603
Responsive to Office Action mailed April 13, 2005

Claim 64 (Previously Presented): The cross-bar switch of claim 62, wherein an input port in said set of input ports includes:

a communications interface to receive data packets from a communications link; and
an input port storage buffer coupled to said communications interface to store data from said data packets, said input port storage buffer coupled to at least one data ring in said set of data rings.

Claim 65 (Currently Amended): A method for transferring data packets within a switch to target destinations, said method comprising the steps of:

- (a) receiving a set of data packets;
- (b) transferring said set of data packets to a set of data rings internal to the switch, wherein a set of sink ports ~~is coupled to said set of data rings~~ and a multi-sink port of the switch ~~are~~ is coupled to said set of data rings;
- (c) determining whether said multi-sink port is able to accept data packets, based on a first set of criteria; and
- (d) forwarding a data packet accepted by said multi-sink port to a recipient set of sink ports in said set of sink ports.

Claim 66 (Previously Presented): The method of claim 65, further including the step of:

- (e) said sink ports, collecting data from a data ring in said set of data rings, wherein said data from said data ring has not been forwarded to said sink port by said multi-sink port.

Claim 67 (Previously Presented): The method of claim 66, wherein said step (e) includes the step of:

- (1) a first sink port in said set of sink ports, determining whether a first data packet includes a destination address in a predetermined set of destination addresses.

Application Number 10/036,603
Responsive to Office Action mailed April 15, 2005

Claim 68 (Previously Presented): The method of claim 67, wherein said step (e) includes the step of:

(2) said first sink port, determining whether to accept said first data packet based on a set of criteria.

Claim 69 (Previously Presented): The method of claim 68, wherein said step (e)(2) includes the steps of:

- (i) determining whether said first sink port is enabled to receive data packets;
- (ii) determining whether said first sink port has sufficient resources to store said first data packet;
- (iii) determining whether said first sink port is currently receiving a maximum allowable number of data packets; and
- (iv) determining whether said first data packet has a number of bytes within a predetermined range.

Claim 70 (Previously Presented): The method of claim 65, further including the step of:

- (f) said sink ports in said recipient set of sink ports transmitting said data packet collected in said step (e).

Claim 71 (Previously Presented): The method of claim 65, wherein said step (c) includes the step of:

- (1) determining whether said data packet contains a destination address corresponding to a sink port in said set of sink ports.

Claim 72 (Previously Presented): The method of claim 71, wherein said step (c) further includes the steps of:

- (2) determining whether said multi-sink port is enabled to receive data packets; and
- (3) determining whether said multi-sink port has sufficient resources to store said data packet.

Application Number 10/036,603

Responsive to Office Action mailed April 15, 2005

Claim 73 (Currently Amended): ~~The method of claim 65~~ A method for transferring data packets to target destinations, said method comprising the steps of:

- (a) receiving a set of data packets;
- (b) transferring said set of data packets to a set of data rings, wherein a set of sink ports is coupled to said set of data rings and a multi-sink port is coupled to said set of data rings;
- (c) determining whether said multi-sink port is able to accept data packets, based on a first set of criteria; and
- (d) forwarding a data packet accepted by said multi-sink port to a recipient set of sink ports in said set of sink ports, wherein said step (d) includes the steps of:
 - (1) identifying a destination address in said data packet;
 - (2) identifying said recipient set of sink ports in said set of sink ports; and
 - (3) issuing a transmission request to said recipient set of sink ports.

Claim 74 (Previously Presented): The method of claim 73, wherein said step (d) further includes the steps of:

- (4) receiving an acknowledgement in response to said transmission request from a first sink port in said recipient set of sink ports; and
- (5) transmitting said data packet to said first sink port on a first data bus.

Claim 75 (Previously Presented): The method of claim 74, wherein said step (d) further includes the steps of:

- (6) receiving an acknowledgement in response to said transmission request from a second sink port in said set recipient set of sink ports; and
- (7) transmitting said data packet to said second sink port on a second data bus.

Application Number 10/036,603

Responsive to Office Action mailed April 15, 2005

Claim 76 (Currently Amended): A cross-bar switch comprising:

- a set of input ports to receive data packets from a communications link;

- a set of data rings internal to the cross-bar switch and coupled to each input port to receive data;

- a multi-sink port coupled to each data ring in said set of data rings, wherein said multi-sink port includes:

- a multi-sink port ring interface coupled to said set of data rings to receive data,

- a multi-sink port storage buffer coupled to said multi-sink port ring interface to receive and store data, and

- a sink request port coupled to said multi-sink port storage buffer to receive data from said multi-sink port storage buffer and transmit said data; and

- a set of sink ports coupled to said data ring and said multi-sink port to receive data packets, wherein each sink port in said set of sink ports includes:

- a sink port ring interface coupled to said set of data rings to receive data,

- a sink port storage buffer coupled to said sink port ring interface and said sink request port to receive and store said data, and

- an output port coupled to said sink port storage buffer to receive said data from said sink port storage buffer and transmit said data.

Application Number 10/036,603

Responsive to Office Action mailed April 15, 2005

Claim 77 (Previously Presented): A method for transferring data packets to target destinations, said method comprising the steps of:

- (a) receiving a set of data packets;
- (b) transferring said set of data packets to a set of data rings, wherein a set of sink ports is coupled to said set of data rings and a multi-sink port is coupled to said set of data rings;
- (c) determining whether said multi-sink port is to accept a data packet, based on a first set of criteria, wherein said step (c) includes the steps of:
 - (1) determining whether said data packet contains a destination address corresponding to a sink port in said set of sink ports,
 - (2) determining whether said multi-sink port is enabled to receive data packets, and
 - (3) determining whether said multi-sink port has sufficient resources to store said data packet; and
- (d) forwarding said data packet to a recipient set of sink ports in said set of sink ports, wherein said step (d) includes the steps of:
 - (1) identifying a destination address in said data packet,
 - (2) identifying said recipient set of sink ports, based on said destination address,
 - (3) issuing a transmission request to said recipient set of sink ports,
 - (4) receiving an acknowledgement in response to said transmission request from a first sink port in said recipient set of sink ports,
 - (5) transmitting said data packet to said first sink port on a first data bus,
 - (6) receiving an acknowledgement in response to said transmission request from a second sink port in said set recipient set of sink ports, and
 - (7) transmitting said data packet to said second sink port on a second data bus.